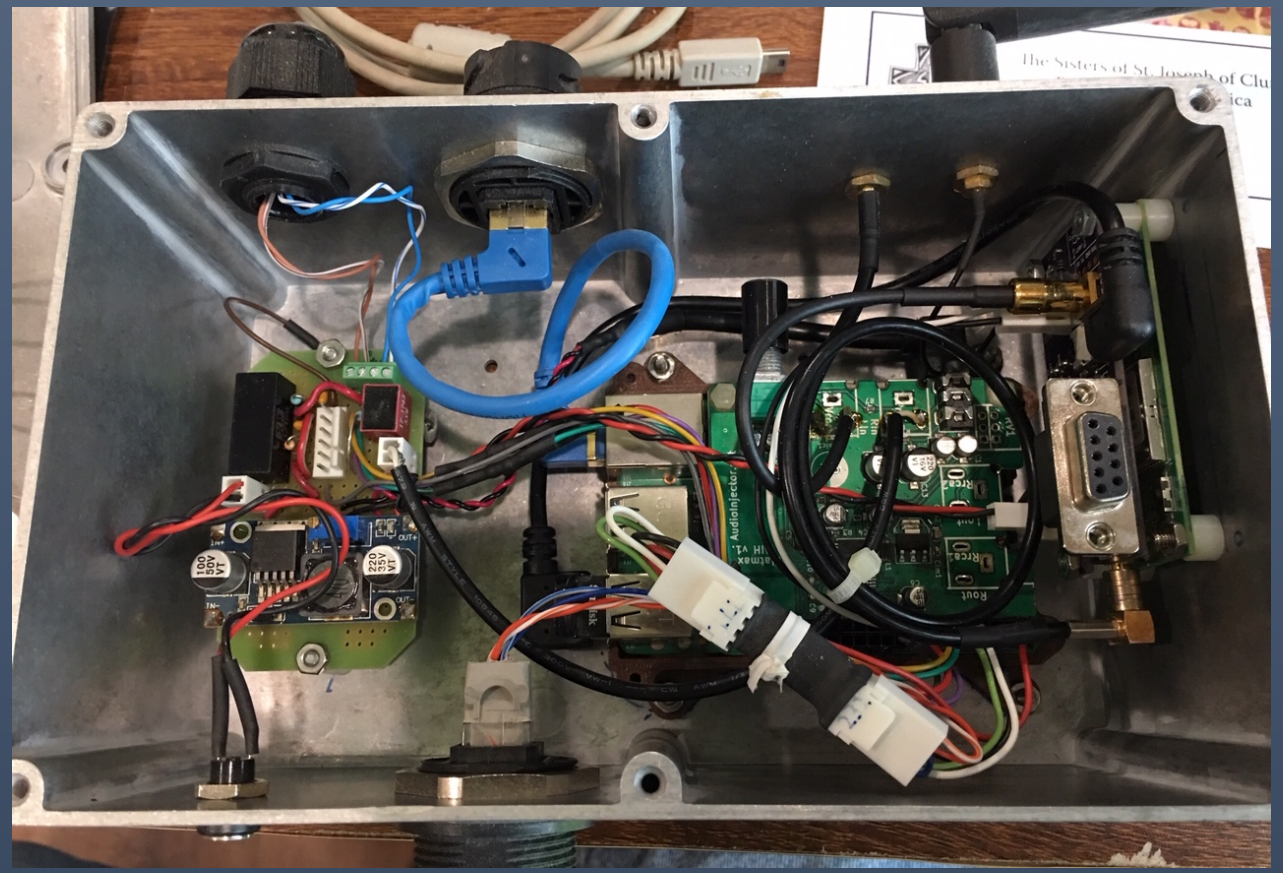
The Whistler Catcher Thin: An Advanced VLF Reception System Based on the Whistler Catcher Pi

HamSCI Workshop 2025

Jonathan Rizzo
KC3EEY
jonathan.rizzo2@scranton.edu

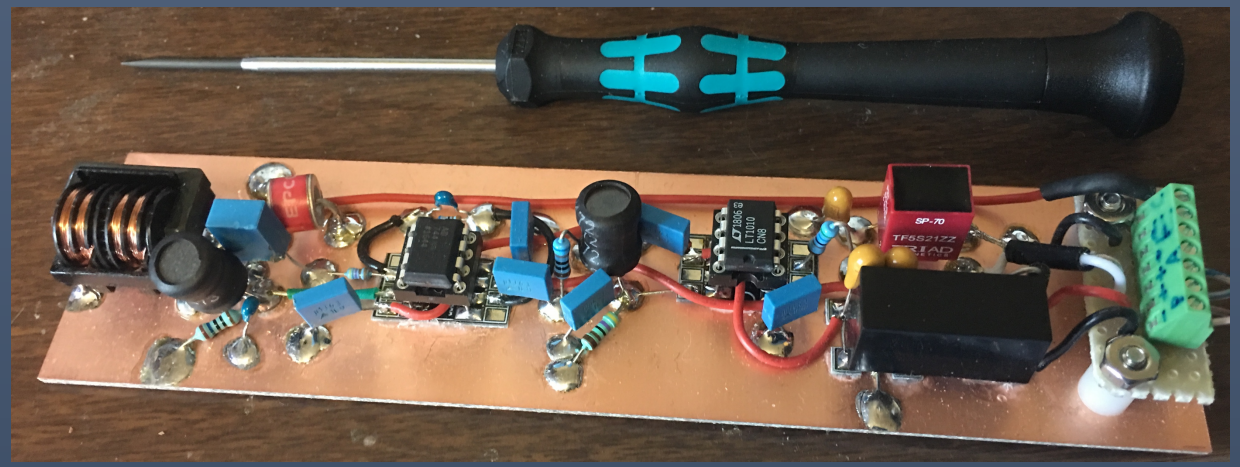
Whistler Catcher Pi VLF Reception System

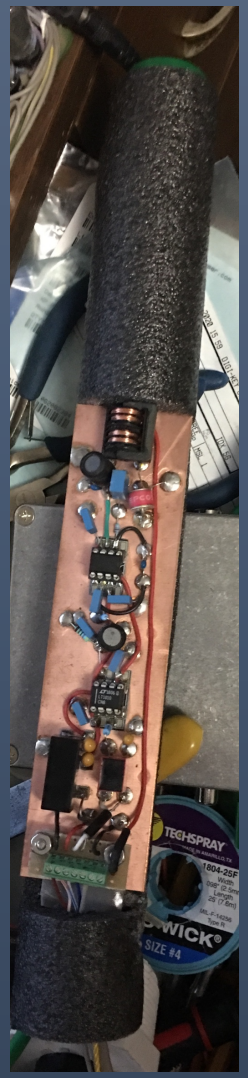
VLF Active Antenna



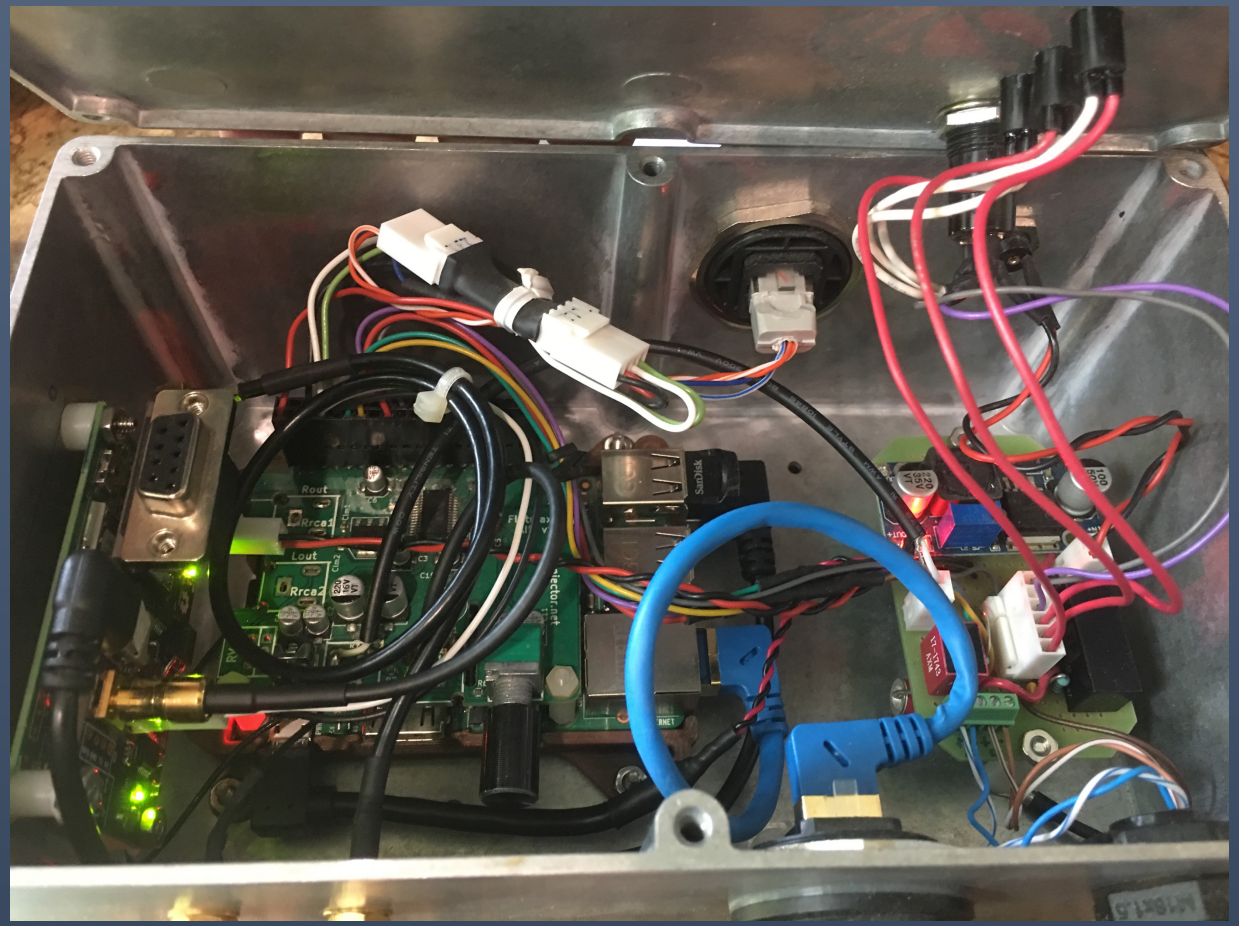
Backend Processor

VLF Active Antenna



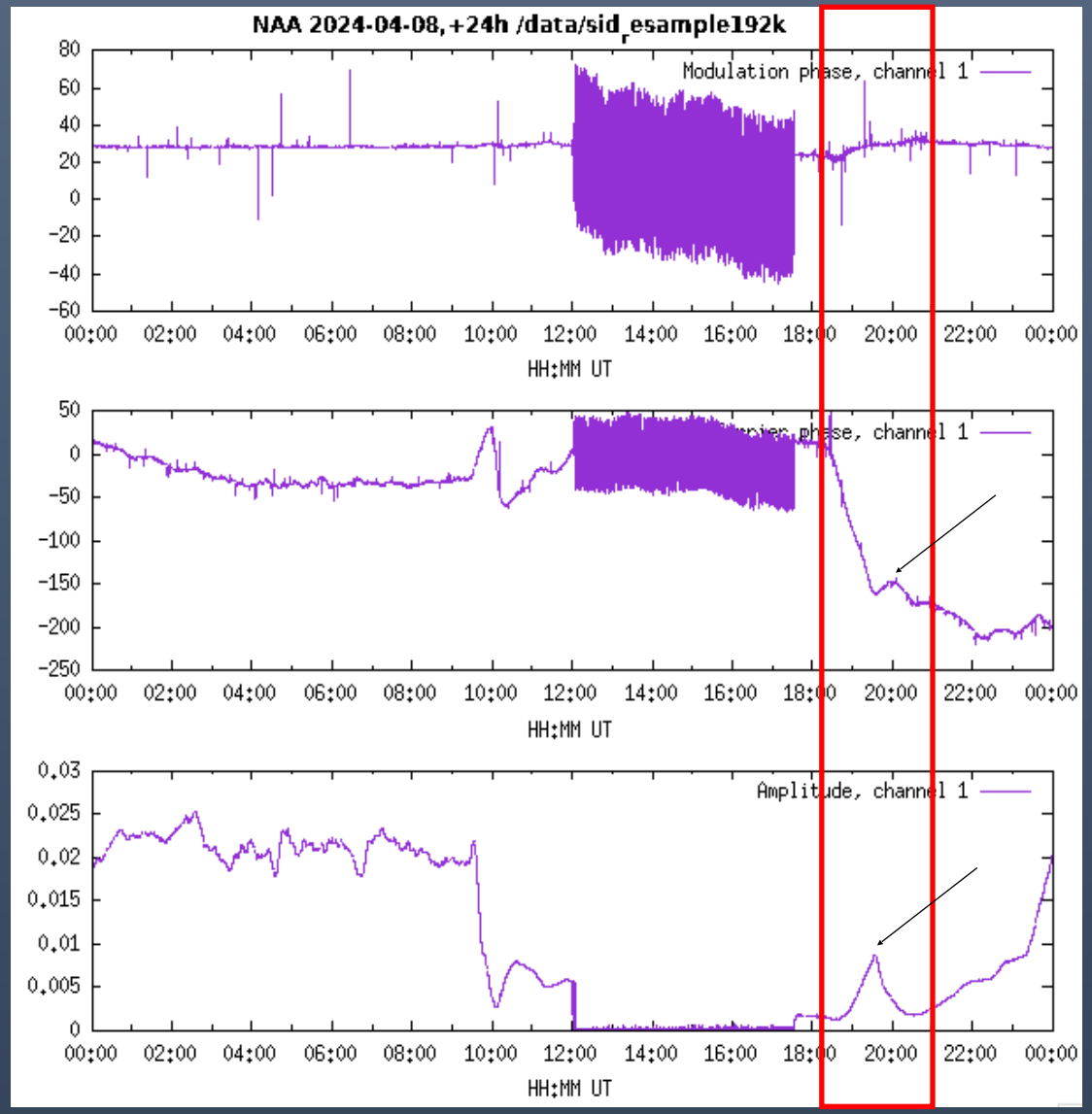


Raspberry Pi Enclosure

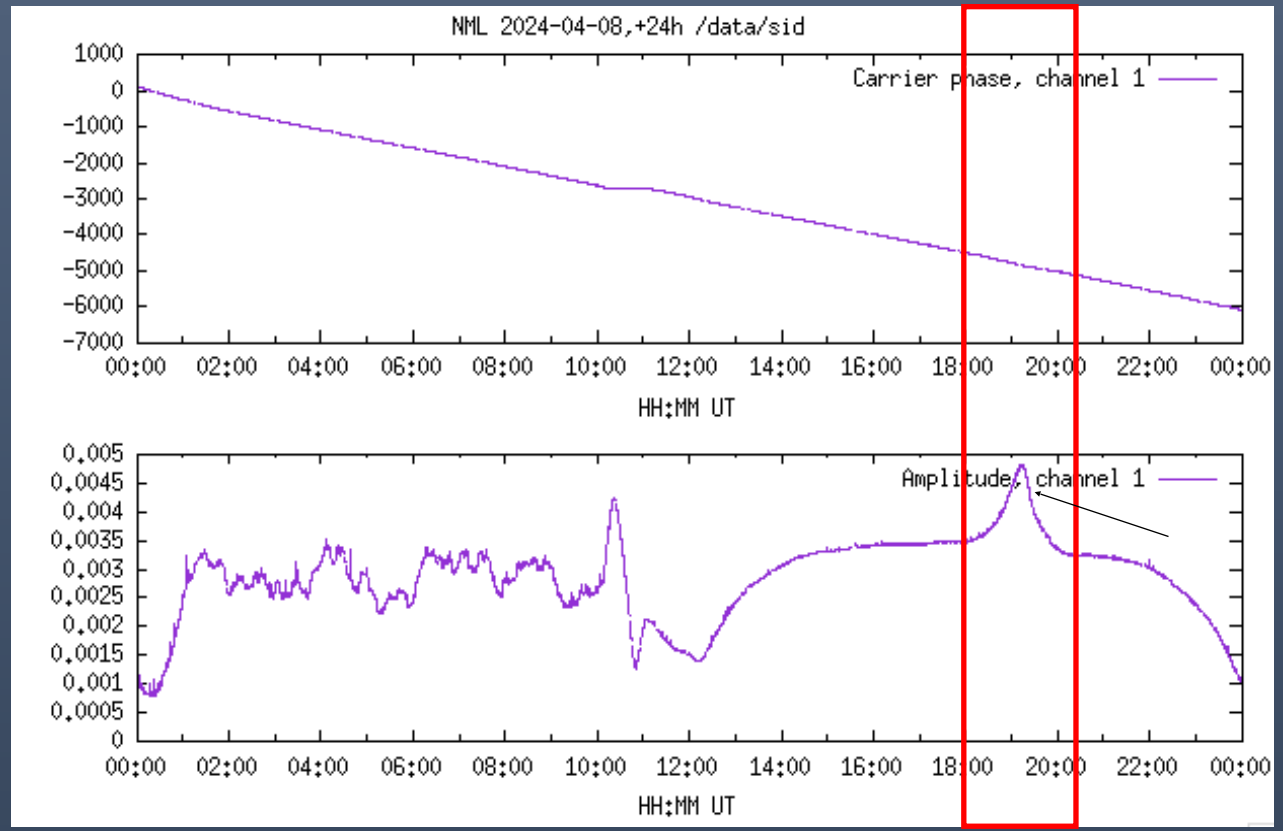


April 8, 2024 Solar Eclipse VLF Observations

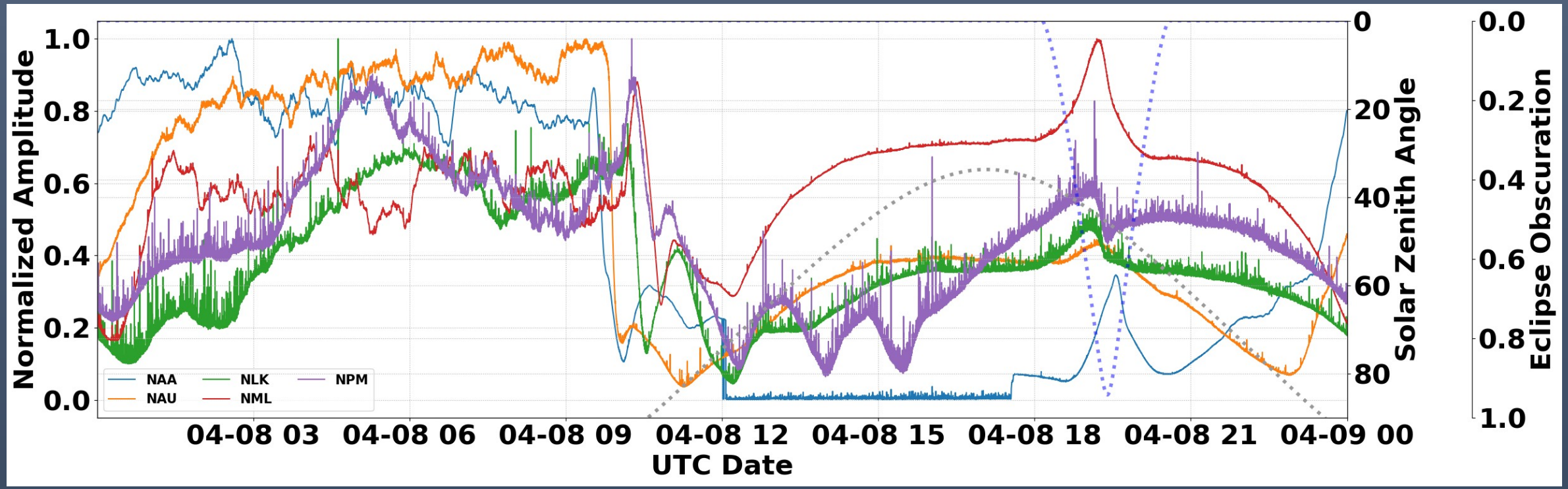
NAA 24 kHz



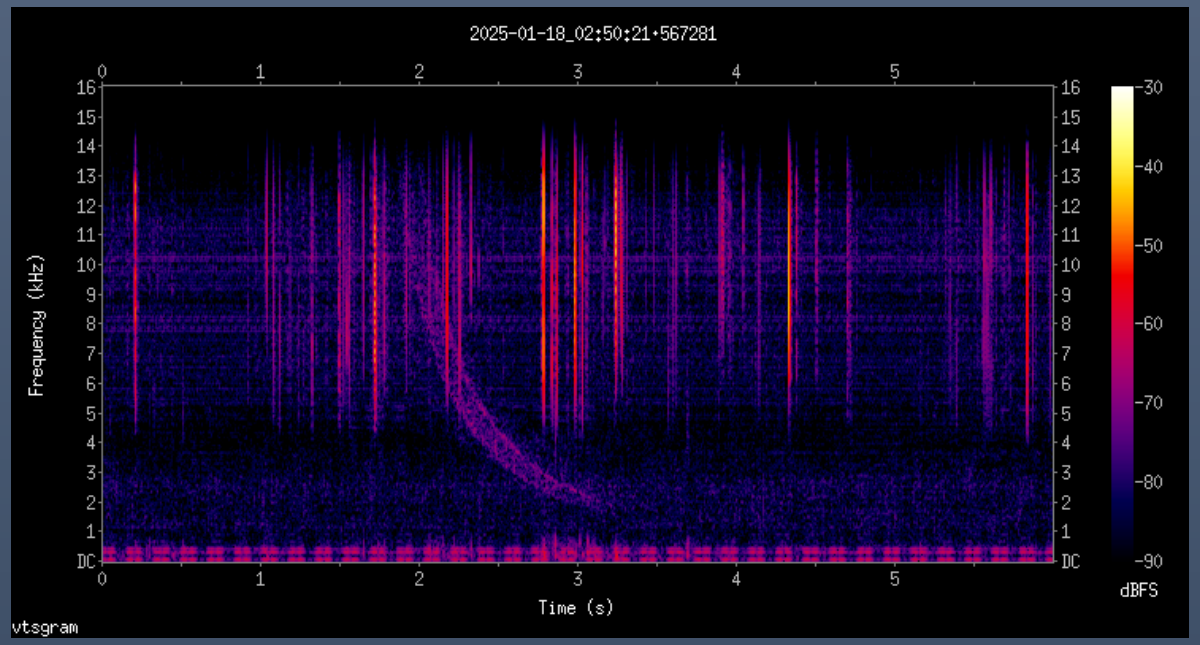
NML 25.2 kHz

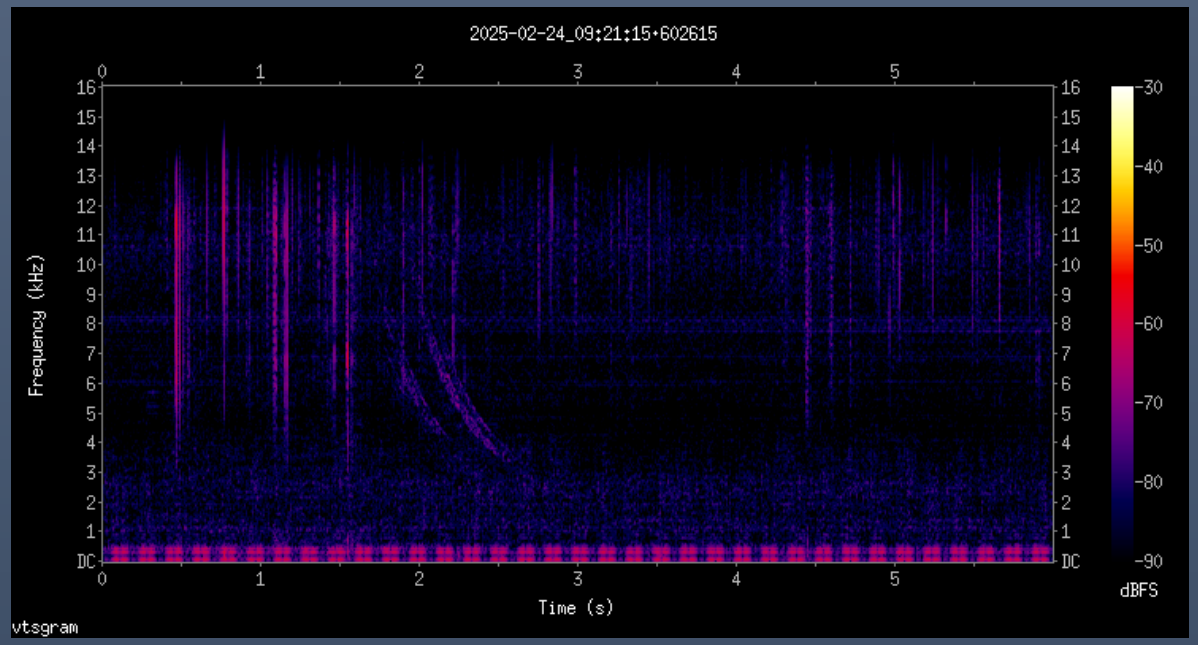


April 8, 2024 Solar Eclipse VLF Observations

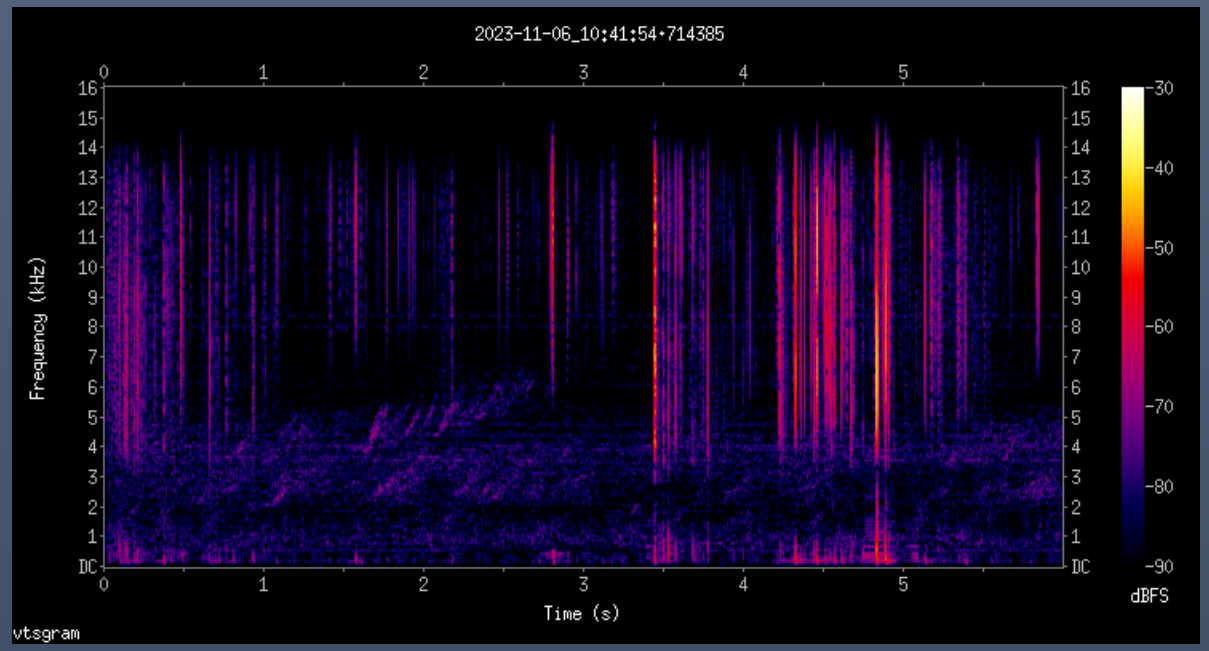


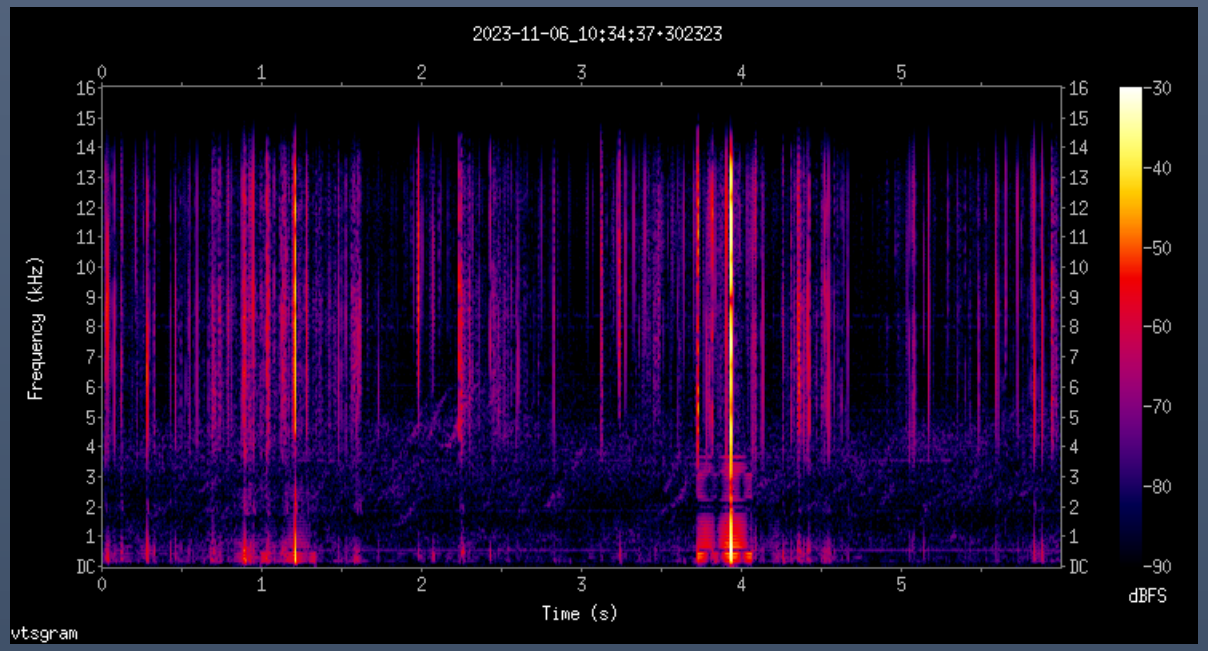
2025 Whistler Events



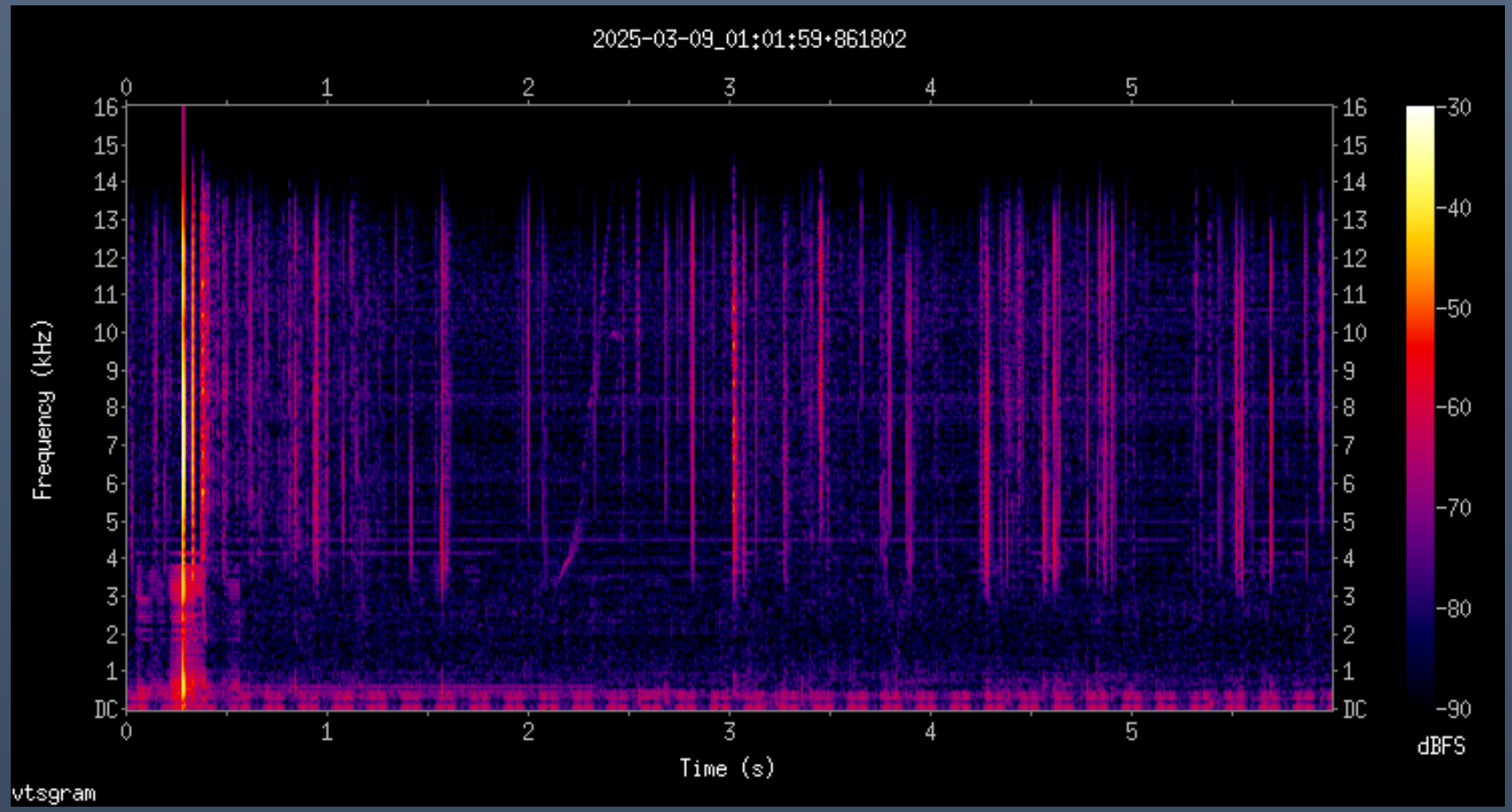


11-6-2023 Dawn Chorus Event





3-9-2025 Riser Event



Whistler Catcher Thin

Behringer UMC202HD
Single-Channel Systems

Behringer UMC404HD
Three-Channel Systems

Dell Wyse 5070 Thin Client PC

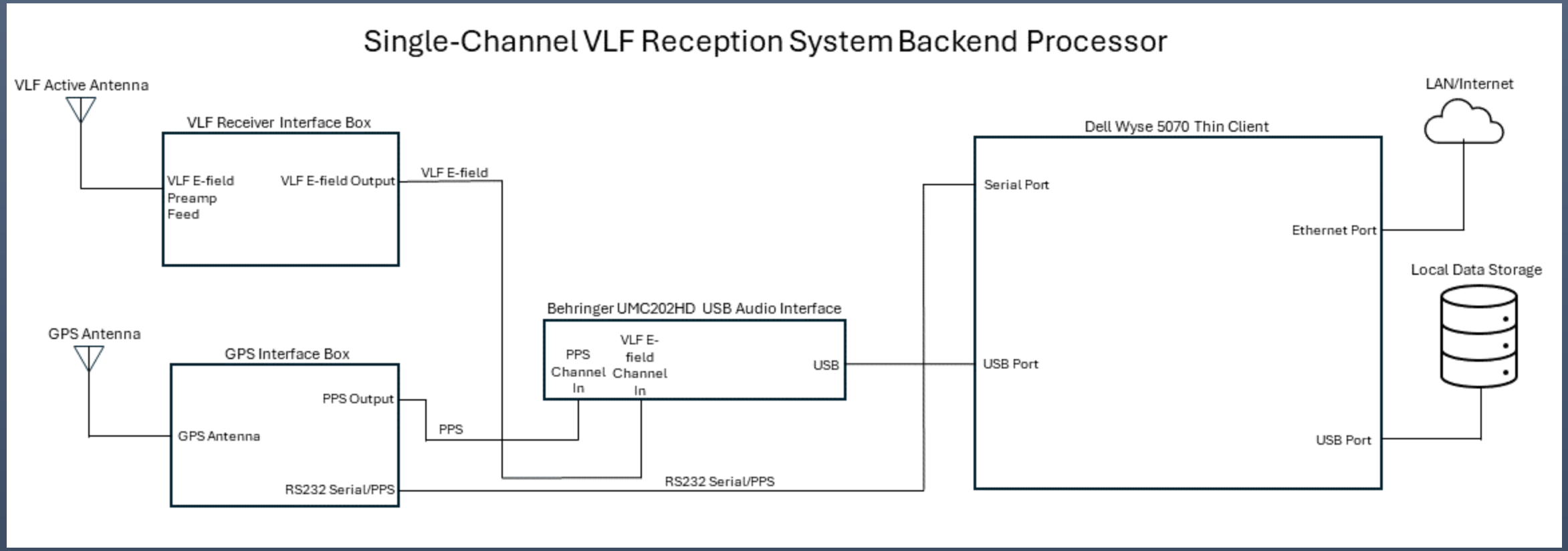
Or

Dell Optiplex 3000 Thin Client PC

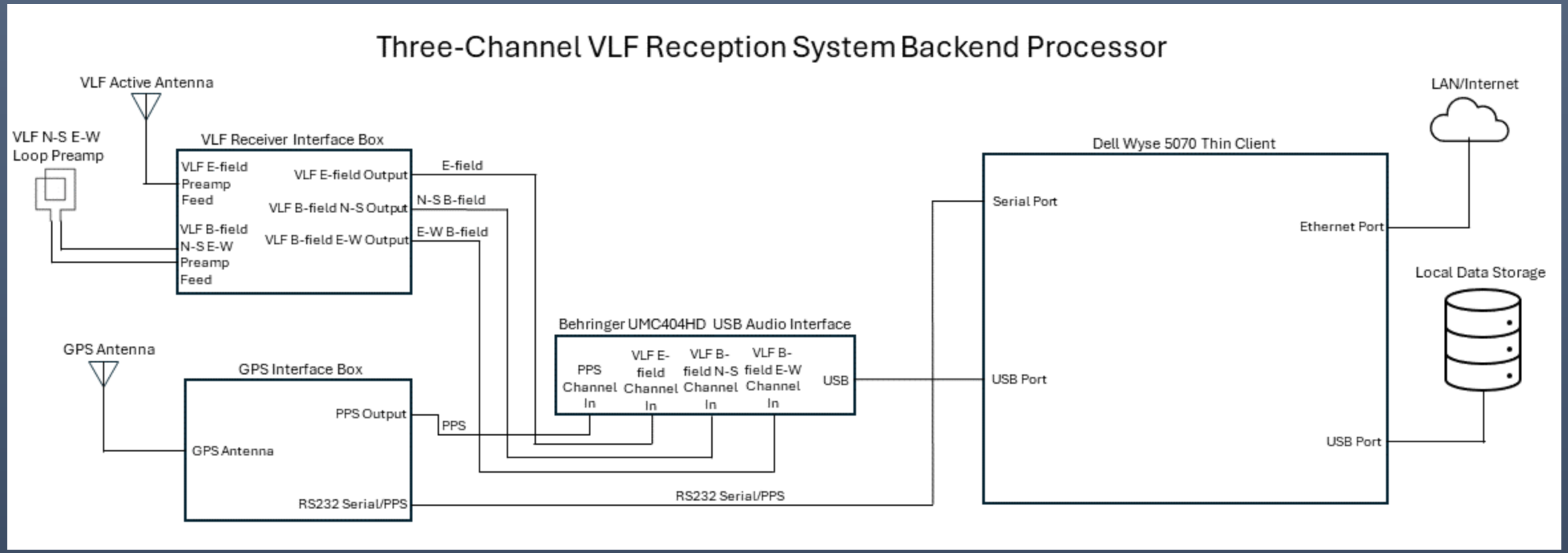
Or

Another equivalent thin client PC with **hardware serial port** for GNSS PPS disciplining.

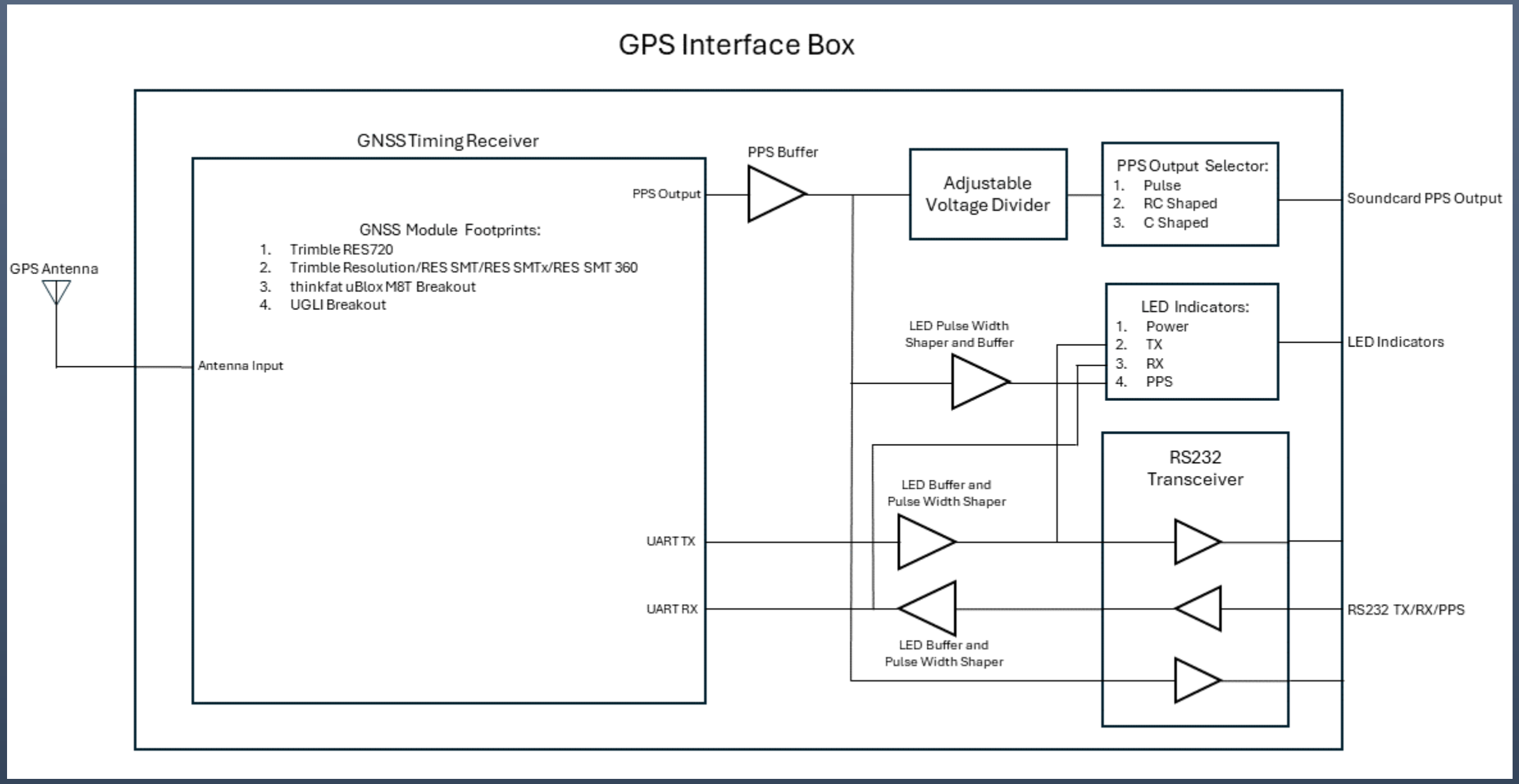
Whistler Catcher Thin



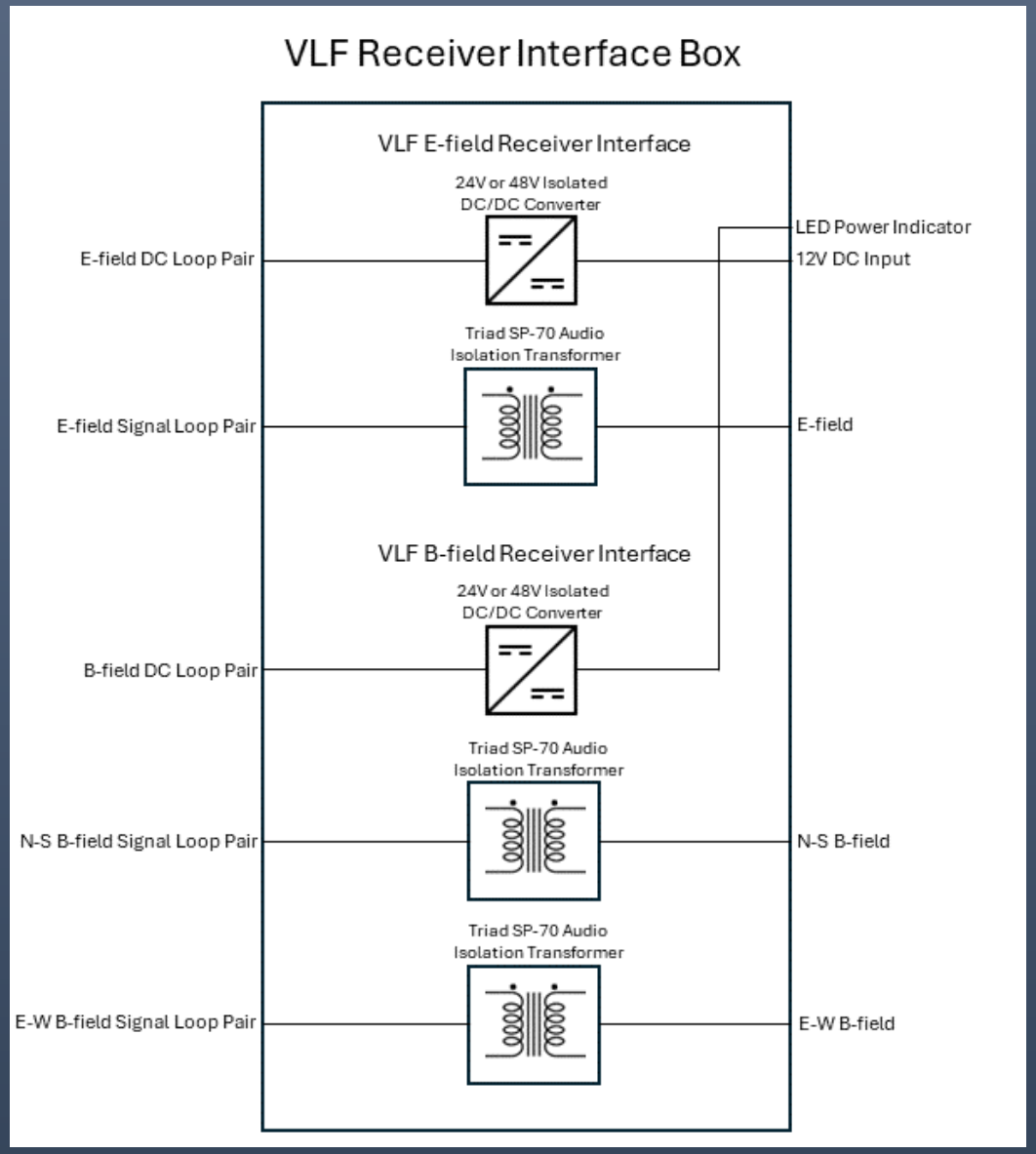
Whistler Catcher Thin

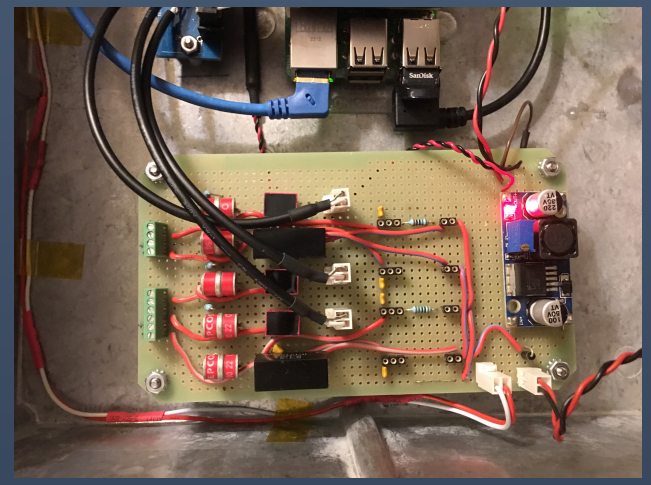


Whistler Catcher Thin

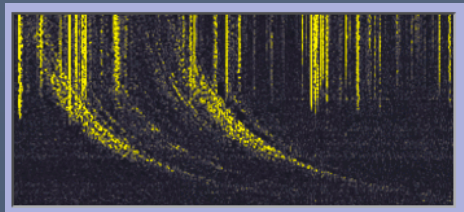


Whistler Catcher Thin


VLF Receiver Interface Box
VLF E-field Receiver Interface
24V or 48V Isolated DC/DC Converter
E-field DC Loop Pair
LED Power Indicator
12V DC Input
Triad SP-70 Audio Isolation Transformer
E-field Signal Loop Pair
E-field
VLF B-field Receiver Interface
24V or 48V Isolated DC/DC Converter
B-field DC Loop Pair
Triad SP-70 Audio Isolation Transformer
N-S B-field Signal Loop Pair
N-S B-field
Triad SP-70 Audio Isolation Transformer
E-W B-field Signal Loop Pair
E-W B-field



abelian.org vlf44 Data Uplink



Live VLF Natural Radio

A collection of live natural radio streams of the VLF band.

- **Live streams**
- **Stereo streams**
- **Sites map**
- **Whistler stats**
- **Data access**
- **Logs**
- **X-Correlation**
- **About**

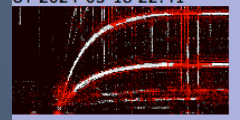
Todmorden, UK 53.703N,2.072W *Paul Nicholson*	0:00 / 0:00	Website Detail Events	Local time 21:29
Cumiana, NW Italy 44.96N,7.42E *Renato Romero, Openlab*	0:00 / 0:00	Website Detail Events	Local time 22:29
Forest, Virginia 37.34385N,79.28818W *Mike Smith*	0:00 / 0:00	Website Detail Events	Local time 17:29
Warsaw, Poland 52.16313N,21.03094E *Jacek Lipkowski*	0:00 / 0:00	Website Detail Events	Local time 22:29
Heathcote, Victoria 36.804163S,144.67559E *Leon Mow Radio Observatory*	0:00 / 0:00	Website Detail Events	Local time 07:29
Heidelberg, Germany 49.443N,8.695E *Stefan Sch*fer*	0:00 / 0:00	Website Detail Events	Local time 22:29
Spring Brook Township, Pennsylvania 41.33N,75.60W *Jonathan Rizzo*	0:00 / 0:00	Website Detail Events	Local time 17:29

Recent Events

No events captured

Older Events

UT 2024-03-18 22:41



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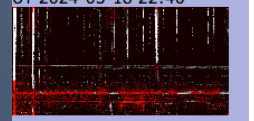

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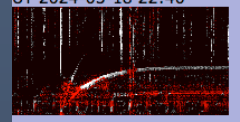

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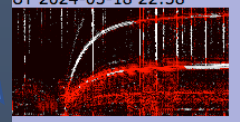

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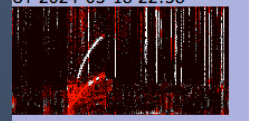

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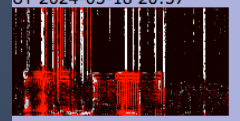

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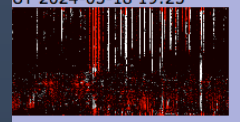
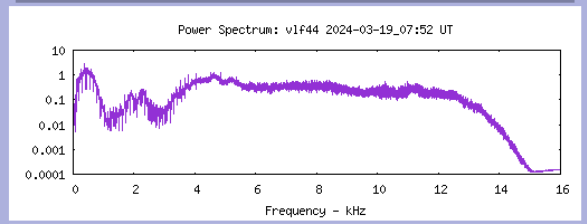
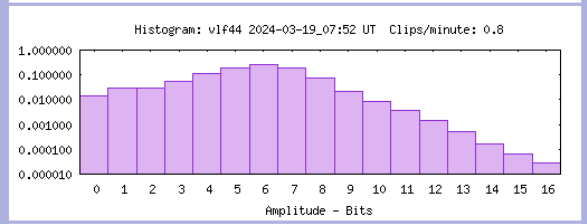


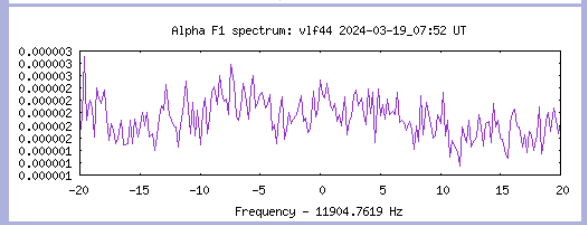
Signal levels, full scale = 1.0

Peak: 1.000000 Floor: 0.000562

RMS: 0.006199 Dynamic range: 65.0 dB







Listen live 0:00 / 0:00

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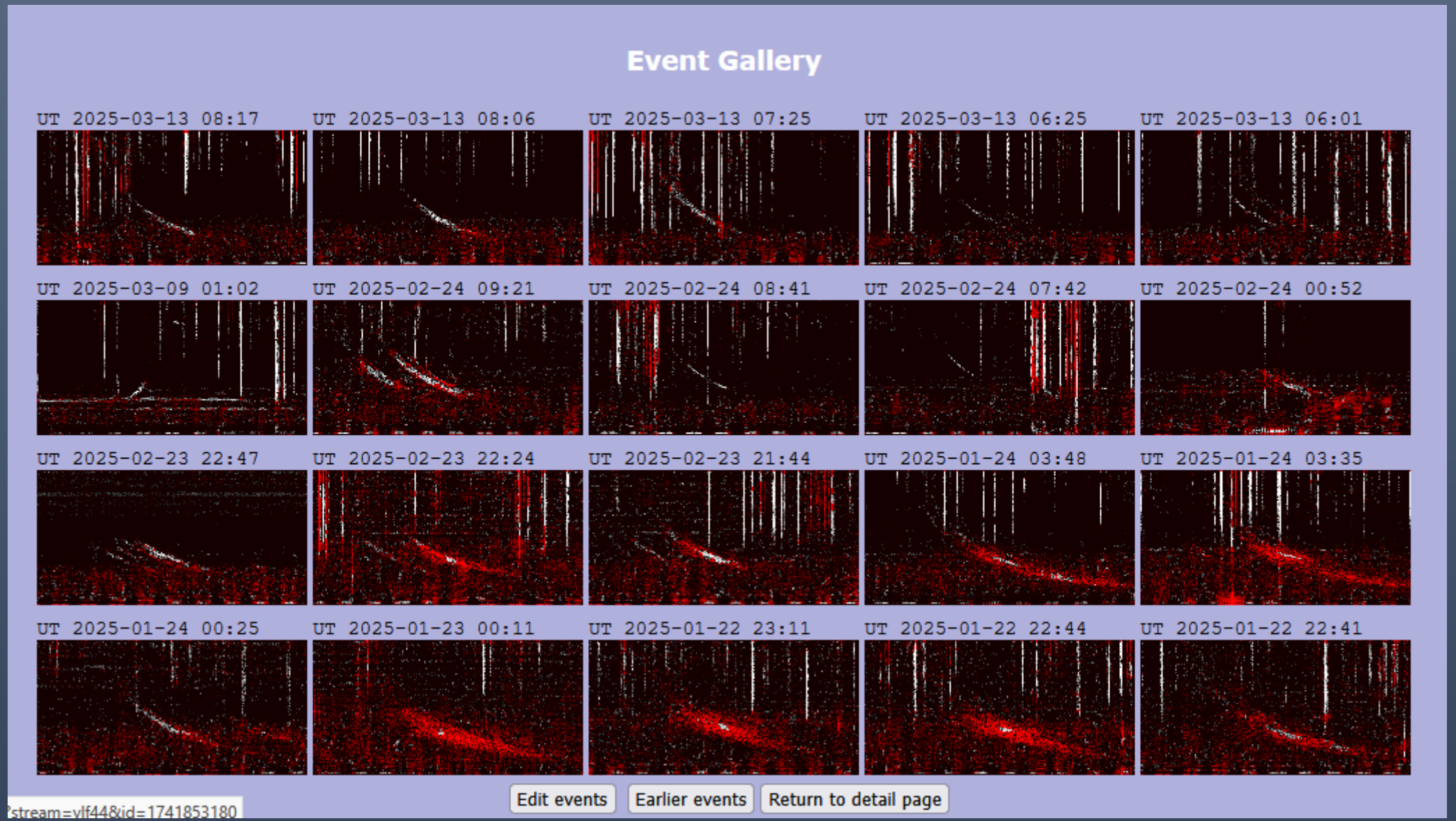
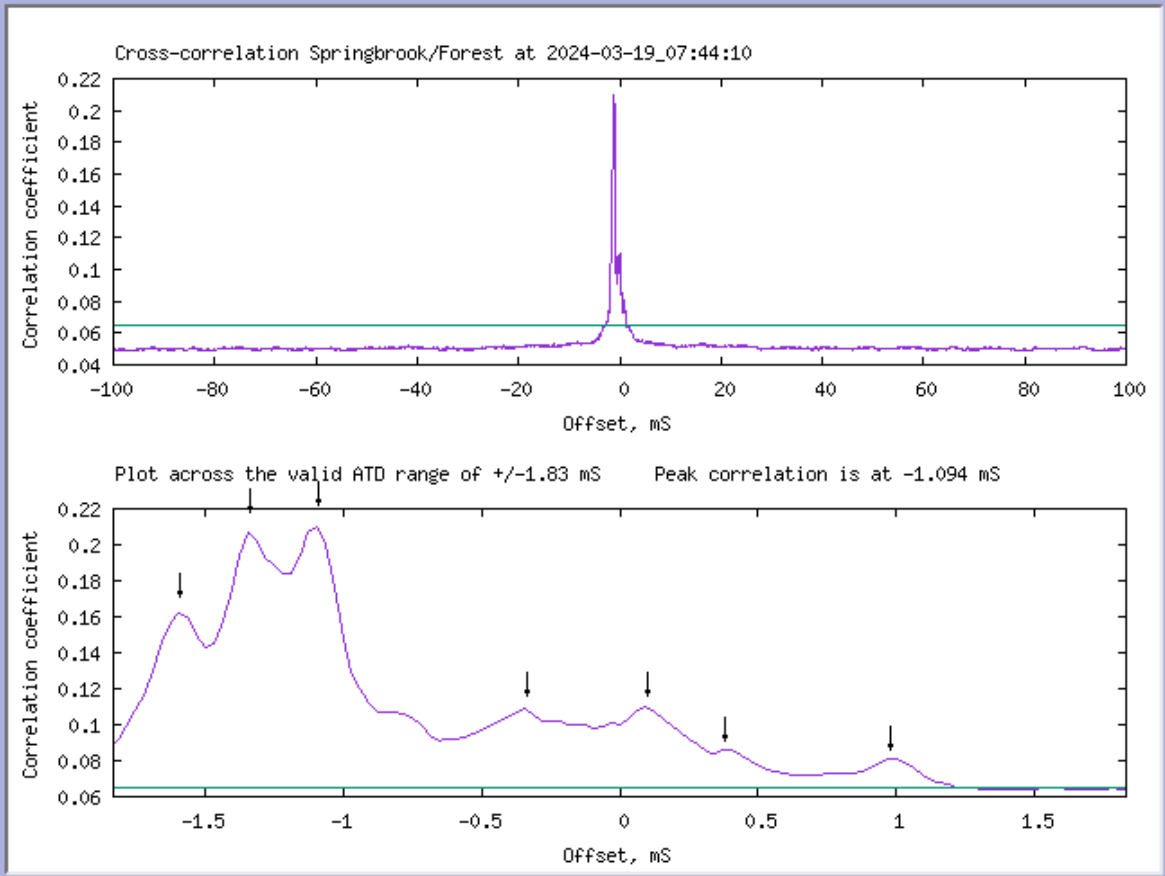


abelian.org vlf44 Data Uplink

Cross-correlation graphs

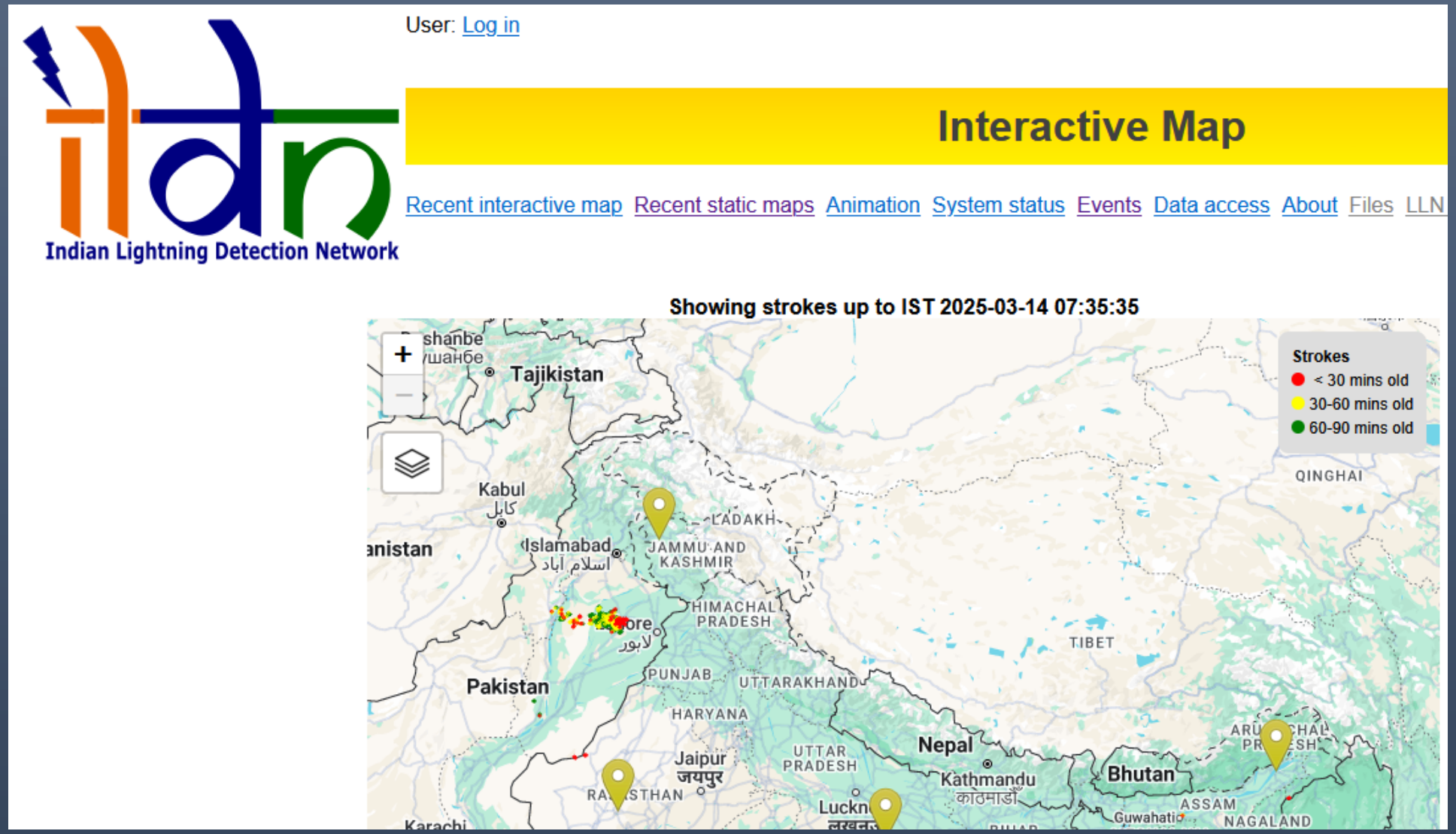
Updated every few minutes: Todmorden/Heidelberg Todmorden/Cumiana Todmorden/Forest Forest/Heidelberg Heidelberg/Cumiana Todmorden/Warsaw Springbrook/Forest



Red circles are the geomagnetic conjugates of the receiver sites.

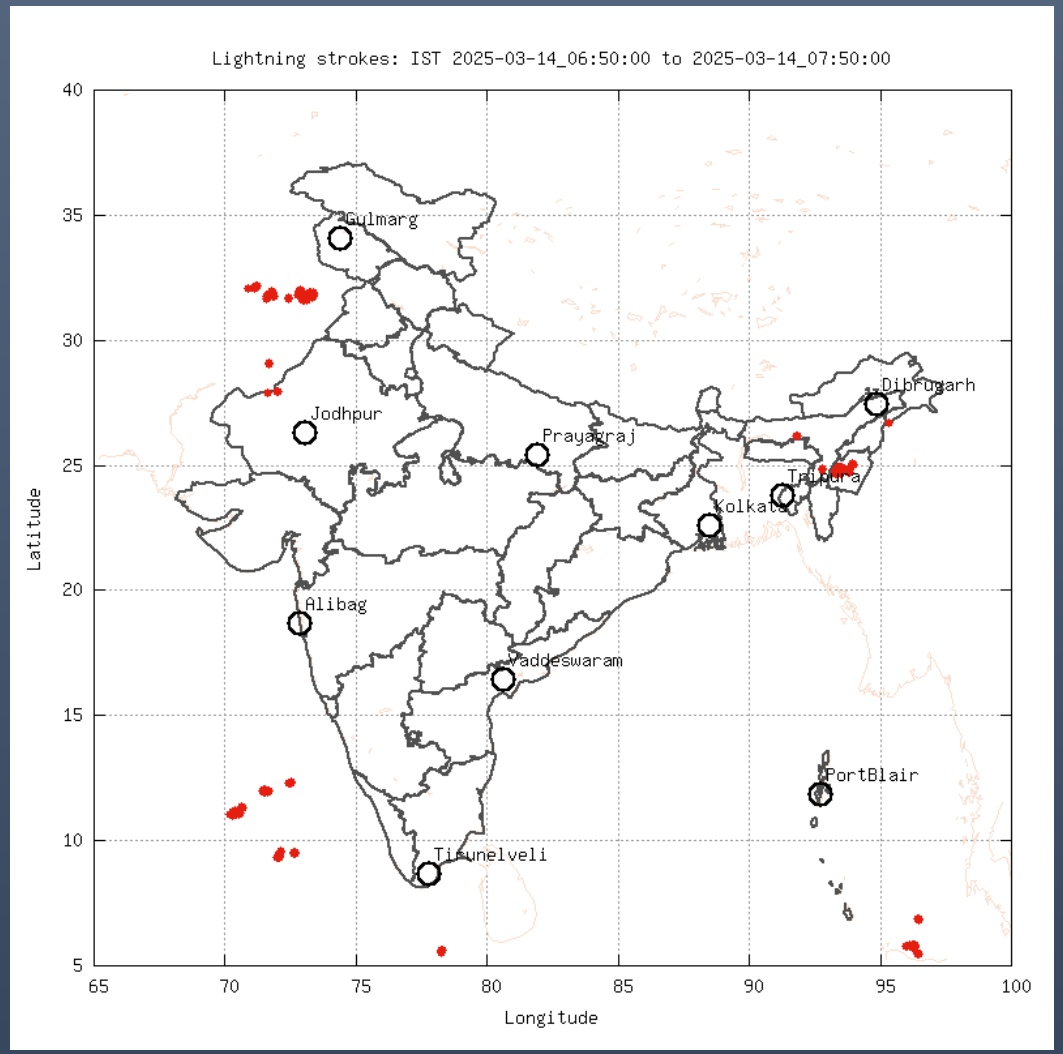
Stream	Site	Location	Operator	Conjugate	Website
vlf1	Todmorden, UK	53.703N,2.072W	Paul Nicholson	-47.014,17.072	http://abelian.org/todmorden-vlf/
vlf15	Cumiana, NW Italy	44.96N,7.42E	Renato Romero, Openlab	-30.067,14.525	http://www.vlf.it
vlf35	Forest, Virginia	37.34385N,79.28818W	Mike Smith	-60.269,-81.225	http://www.unixnut.net/efield.html
vlf38	Warsaw, Poland	52.16313N,21.03094E	Jacek Lipkowski	-42.130,35.301	https://klubnl.pl/wpr/en/
vlf39	Heathcote, Victoria	36.804163S,144.67559E	Leon Mow Radio Observatory	53.326,150.669	https://asv.org.au/ASV-Heathcote
vlf41	Heidelberg, Germany	49.443N,8.695E	Stefan Sch&#65533;fer	-38.055,20.264	http://www.iup.uni-heidelberg.de/schaefer_vlf/DK7FC_VLF_Grabber2.html
vlf44	Spring Brook Township, Pennsylvania	41.33N,75.60W	Jonathan Rizzo	-63.584,-74.699	

Indian Lightning Detection Network (ILDN)

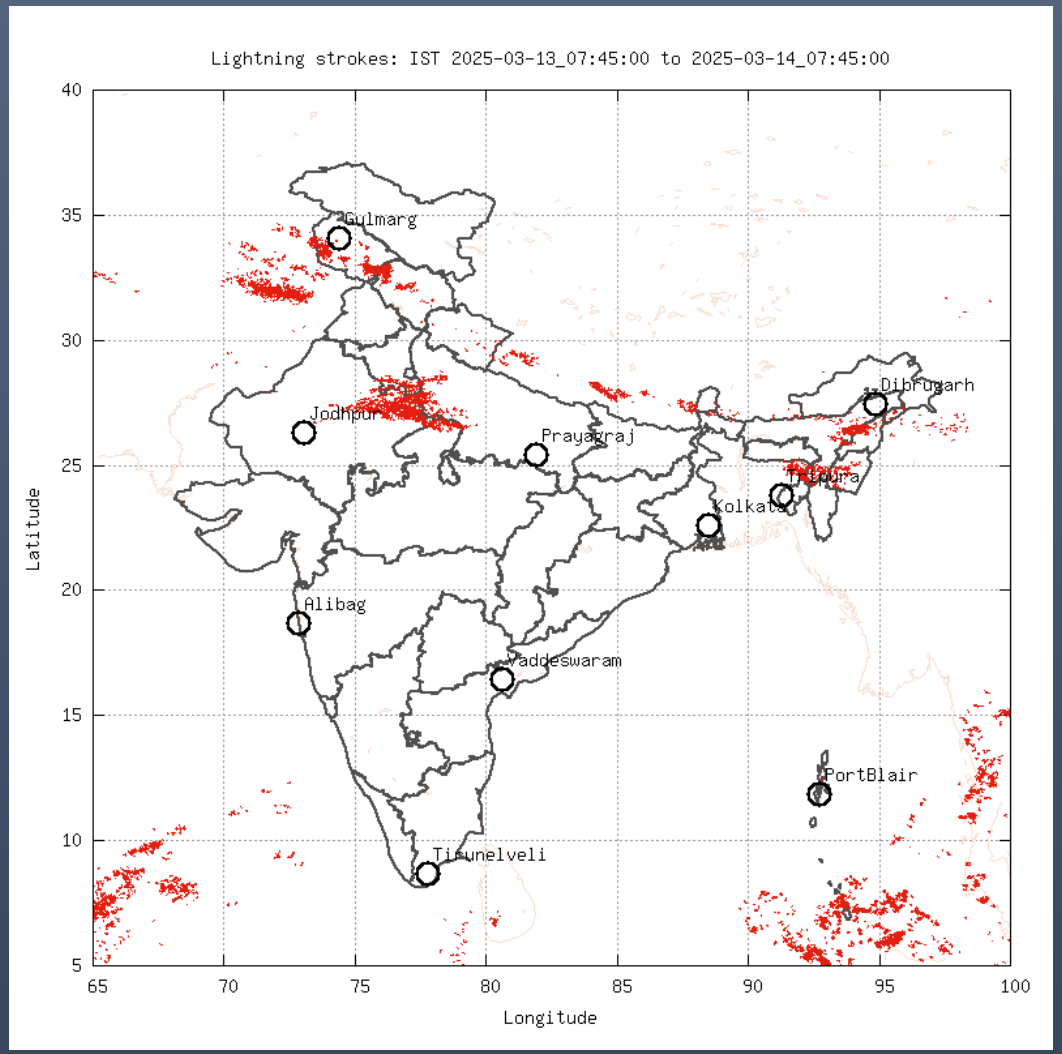


Indian Lightning Detection Network (ILDN)

Past 60 minutes



Past 24 hours



Thank you!

- I’d like to offer my gratitude to the following:
  - Paul Nicholson for his endless support, vlfrx-tools, and *MANY* contributions to myself and the VLF community at large.
  - The VLF Community (VLF Natural Radio groups.io group, VLF Facebook Groups)
  - Gary Miller for his amazing support and updates to gpsd that includes Trimble timing receiver support.
  - Dr. Nathaniel Frissell W2NAF for endless support and motivation for this project.
  - Carl F. Eddy AA3WR for the countless support and inspiration he was to me.
- We gratefully acknowledge support to this project from NSF Grants AGS-2002278, AGS-1932997, and AGS-1932972.